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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,746	12/24/2003	Masaharu Itaya	MAM-036	9105

20374 7590 02/01/2007
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EXAMINER

DOVE, TRACY MAE

ART UNIT	PAPER NUMBER
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1745

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/01/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/743,746

Applicant(s)

ITAYA ET AL.

Examiner

Tracy Dove

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 2,3,17 and 18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-16 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/24/03, 5/4/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The information disclosure statements (IDSs) submitted on 12/24/03 and 5/4/04 have been considered by the examiner.

Election/Restrictions

Applicant's election without traverse of Group I, claims 1 and 4-19, in the reply filed on 1/19/07 is acknowledged.

Claims 17 and 18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 1/19/07. The elected species is magnesium bistrifluoromethanesulfonimide.

Claims Analysis

Claim 1 recites "for a nonaqueous battery", which is not given patentable weight because it is an intended use limitation. Claims 4-8 recite "for a nonaqueous battery", which is not given patentable weight because it is an intended use limitation.

Claims 7 and 8 recite limitations further limiting the molten salt of claim 4. However, neither claim 7 nor claim 8 positively recites the magnesium salt is dissolved in a molten salt. A

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magnesium salt dissolved in an organic solvent would read upon claims 7 and/or 8 because claim 4 teaches an organic solvent or a molten salt is used to dissolve the magnesium salt.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4-10, 14 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4 and 9 recite the term “and/or”, which is indefinite. Examiner suggests “at least one of an organic solvent or a room temperature molten salt...”. Furthermore, the term “ordinary temperature” should be deleted from claim 9 because it is a relative term.

Claim 14 should recite “at least one of an imide salt or a sulfonate” to provide proper group language. Claim 19 should recite “at least one selected from the group consisting of a magnesium metal...” to provide proper group language.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this

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subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 4-12, 14-16 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshimoto et al., Electrochimica Acta 46 (2001) 1195-1200, Ionic conductance of polymeric electrolyte consisting of magnesium salts dissolved in cross-linked polymer matrix with linear polyether (Yoshimoto1).

Yoshimoto1 teaches the conductivity of the electrolyte depends of the kind of dissolved magnesium salt. The highest conductivity was obtained for the polymeric electrolyte containing $\text{Mg}[(\text{CF}_3\text{SO}_2)_2\text{N}]_2$. A Mg/Mg cell using the polymeric electrolyte proved that Mg^{2+} is mobile (abstract). The magnesium ion is mobile and electrochemically active (page 1195). Polymeric gel systems swollen with aprotic solvents such as propylene carbonate have been proposed as high Mg^{2+} conductors. The polymeric system of Yoshimoto consists of oligo(ethylene oxide)-grafted polymethacrylate matrix and linear polyether which dissolves magnesium salts (1196). The electrolytic salt may be $\text{Mg}(\text{ClO}_4)_2$, $\text{Mg}(\text{CF}_3\text{SO}_3)_2$ or $\text{Mg}[(\text{CF}_3\text{SO}_2)_2\text{N}]_2$ (1196; col. 1). A solvent such as N,N-dimethyl formamide (DMF) can be used to improve the conductivity of the electrolyte (1200). Thus the claims are anticipated.

*

Claims 1 and 4-10 are rejected under 35 U.S.C. 102(a) as being anticipated by Yoshimoto et al., Electrochimica Acta 48 (2003) 2317-2322, Rechargeable magnesium batteries with polymeric gel electrolyte containing magnesium salts (Yoshimoto2).

Yoshimoto2 teaches polymer gel electrolyte with magnesium imide $\text{Mg}[(\text{CF}_3\text{SO}_2)_2\text{N}]_2$ as the electrolytic salt and mixed alkyl carbonates as the plasticizer. The highest conductivity was

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obtained for EC+DMC (ethylene carbonate+dimethyl carbonate) dissolving $\text{Mg}[(\text{CF}_3\text{SO}_2)_2\text{N}]_2$ (abstract). Thus the claims are anticipated.

*

Claims 1 and 4 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoshikawa et al., US 2003/0127129.

Yoshikawa teaches a charge transfer material preferably comprising a magnesium salt wherein magnesium is coupled with an anion. The anion is preferably a bistrifluoromethane sulfonimide, the bistrifluoromethane sulfonamide is particularly preferred (0062). The charge transfer material may be an ion-conductive electrolytic composition. The ion-conductive compositions include molten electrolytic slats, electrolytic solutions having redox couples dissolved in solvents and solid electrolytic compositions (0066). The molten salt electrolyte may be used with or without a solvent (0079). The charge transfer material is usable for a solvent for chemical reactions, cells, etc (0039). Thus the claims are anticipated.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaura et al., US 6,426,164 in view of Armand, US 5,072,040.

Yamaura teaches a non-aqueous electrolyte battery incorporating magnesium as a charge carrier. The non-aqueous electrolyte, disposed between a negative electrode and a positive

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electrode, contains a non-aqueous solvent and an electrolyte constituted by magnesium salt (abstract). The negative electrode may be magnesium or an alloy of magnesium (2:58-62). Since magnesium ions are diffused into the positive electrode, the positive electrode includes magnesium (3:5-42). The magnesium salts are listed at column 3, lines 63-67. The solvents are listed at column 4, lines 1-14. The solvent may be dimethoxyethane or a carbonate.

Yamaura does not explicitly state the magnesium salt is $\text{Mg}[(\text{CF}_3\text{SO}_2)_2\text{N}]_2$. However, Armand teaches the preparation of $\text{Mg}[(\text{CF}_3\text{SO}_2)_2\text{N}]_2$ (Example 4). Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Armand teaches perfluorosulfonylimides are useful as salts in liquid electrolyte. One of skill would have been motivated to use the $\text{Mg}[(\text{CF}_3\text{SO}_2)_2\text{N}]_2$ magnesium salt for the magnesium salt of Yamaura because Armand teaches such magnesium salts are useful for liquid electrolytes. Armand teaches aprotic polar solvents in column 3, lines 26-32.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

January 31, 2007



TRACY DOVE
PRIMARY EXAMINER